Clean Version of Claims

1. A clad-pumped, double clad, fiber laser, comprising:

one or more cores disposed within a pump cladding;

each core doped with a rare earth lasing ion;

each core having an oblong cross section;

there being either (a) a single core or (b) a central core and additional cores disposed outwardly of said central core, oriented in an array along a line inclusive of the center of said cladding with their long axes perpendicular to said line and with an equal distance between the centers of adjacent cores;

thereby to provide a linearly polarized output laser beam;

there being a mode discriminating core characteristic selected from (c) index of refraction, (d) gain, and (e) cross sectional dimension, said characteristic, in a fiber having a single core, being greatest at the center of said single core and progressively lower toward the periphery of said single core, said characteristic of said central core, in a fiber having additional cores, being greater than said characteristic of all others of said cores, said characteristic of each one of said other cores being lower than said characteristic of any of said cores that are closer to said central core than said one of said cores;

thereby causing radiation in said cores to phase-lock and transfer laser power coherently into a linearly polarized, bright laser beam of the fundamental in-phase supermode from all higher order supermodes belonging to the same array structure.

2. A clad-pumped, double clad, fiber laser, comprising:

one or more cores disposed within a pump cladding;

each core doped with a rare earth lasing ion;

there being either (a) a single core or (b) a central core and additional cores disposed outwardly of said central core;

there being a modal discriminating core characteristic selected from (c) index of refraction, (d) gain, and (e) cross sectional dimension, said characteristic, in a fiber having a single core, being greatest at the center of said single core and progressively lower toward the periphery of said single core, said characteristic of said central core, in a fiber having additional cores, being greater than said characteristic of all others of said cores, said characteristic of each one of said other cores being lower than said characteristic of any of said cores that are closer to said central core than said one of said cores;

thereby causing radiation in said cores to phase-lock and transfer laser power coherently into a bright laser beam of the fundamental in-phase supermode from all higher order supermodes belonging to the same array structure.

3. A laser according to claim 2 wherein:

there are a plurality of cores with the center to center spacing of said cores being between 15 and 50 microns.

4. A laser according to claim 2 wherein:

the cross section of said pump cladding is circular.

5. A laser according to claim 2 wherein:

the cross section of said pump cladding is rectangular.

6. A laser according to claim 2 wherein:

each core has an oblong cross section;

there being either (f) only one core or (g) a plurality of cores oriented in an array along a line inclusive of the center of said cladding with their long axes perpendicular to said line and with an equal distance between the centers of adjacent cores;

thereby to provide a linearly polarized output laser beam.

7. A laser according to claim 2 wherein:

there is only one core.

8. A laser according to claim 2 wherein:

there are a plurality of said cores are arranged isometrically in at least one ring surrounding said central core.

9. A laser according to claim 8 wherein:

there is only one ring of six cores surrounding said central core.

10. A laser according to claim 8 wherein:

there is a first ring of six cores surrounding said central core and a second ring of twelve cores surrounding said first ring.

11. A laser according to claim 2 wherein:

said characteristic is index of refraction.

12. A laser according to claim 2 wherein:

there are a plurality of cores and said characteristic is gain.

13. A laser according to claim 2 wherein:

there are a plurality of cores and said characteristic is cross sectional dimension.

14. (Amended) A clad-pumped, double clad, fiber laser, comprising:

one or more cores disposed within a pump cladding;

each core doped with a rare earth lasing ion;

each core having an oblong cross section;

there being either (a) a central core and additional cores disposed outwardly of said central core, oriented in an array along a line inclusive of the center of said cladding with their long axes perpendicular to said line and with an equal distance between the centers of adjacent cores or (b) a single core;

thereby to generate, when optically pumped, a single linearly polarized TE_0 mode output laser beam.

15. A laser according to claim 14 wherein:

there is only one core.

16. A laser according to claim 14 wherein:

there are a plurality of cores with substantially the same cross sectional area as each other of said cores.

17. A laser according to claim 14 wherein:

there are a plurality of cores with substantially the same refractive index.

18. A laser according to claim 14 wherein:

there are a plurality of cores, said cores having a characteristic selected from (a) index of refraction, (b) gain, and (c) cross sectional dimension, said characteristic of said central core being greater than said characteristic of all others of said cores, said characteristic of each one of said other cores being lower than said characteristic of any of said cores that are closer to said central core than said one of said cores;

thereby causing radiation in said cores to phase-lock and transfer laser power coherently into a bright laser beam of the fundamental in-phase supermode from all high order supermodes belonging to the same array structure.

19. A laser according to claim 14 wherein:

there are a plurality of cores, the center to center spacing of said cores is between 15 and 50 microns.

b
cwc

20. A laser according to claim 14 wherein:

said pump cladding has a circular cross section.

21. A laser according to claim 14 wherein:

each core is rectangular.